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Community structure, succession and development of coral reefs in Hawaii.

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Abstract:

Reef building corals in the Hawaiian Archipelago consist of only 42 species belonging to 16 genera. The Hawaiian coral fauna is highly depauperate relative to the Indo-West Pacific Ocean, a result most likely due to geographic isolation. Although impoverished, the species composition of reef building corals is remarkably uniform throughout the archipelago. Differences in species composition which do exist appear to be caused by varying patterns of disturbance and recruitment. The differences in species composition between islands are small. Where adequate substrate prevail within the euphotic zone most species are present. Species composition tends to be an all or none phenomenon. A positive correlation does not exist between species richness and habitat area (0 to 20 m). This may be due to low habitat complexity within the zone for reef building corals and high rates of recruitment between islands. It also suggests that most reef building corals in Hawaii are generalized species. A hypothetical model operational over generations is presented demonstrating the effect of disturbance on the successional process for coral reefs in general.